

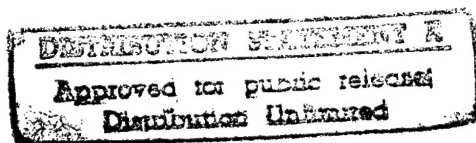
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BERING STRAIT DAM

- USSR -

DTIC QUALITY INSPECTED 2

by Boris Lyubimov

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BERING STRAIT DAM

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Since N. S. Khrushchev's historic trip to the United States, a general thaw has been felt all over the world. Ice floes of the "cold war" are cracking. People everywhere are becoming aware that peaceful co-existence, renunciation of war, general disarmament will usher in the epoch of the realization of grandiose projects that will improve life on our planet.

Man's ability to triumph over nature is limitless. Modern science and technology have armed him with powerful means of reclaiming barren deserts, subjugating the cosmos, changing the climate, and mastering the mighty and inexhaustible energy of the atom.

Today we are publishing an article about a daring project of a Soviet engineer, a laureate of the Stalin Prize P. M. Borisov, who is dreaming of erecting a gigantic dam across Bering Strait and of changing the face of the Arctic: to alter the climate of the Arctic regions, to transform the vast areas of eternal frost on the territory of the United States, the USSR, and Canada into fertile grain fields.

"Literaturnaya Gazeta" appeals to scientists and engineers throughout the world to tell on its pages about their creative plans and projects directed toward improvement of life on earth.

A dam across the Bering Strait... Isn't it just a flight of fancy? How could we find out more about it? Apparently we must look for the man who has suggested such a daring idea. But who is he? Where are we to seek him? At the Academy of Sciences? At the Arctic Institute? At the Institute of Oceanology? Or maybe on an ice floe drifting somewhere on the Arctic Ocean?

But everything turned out to be much simpler. A trolleybus took us to Kikitskiye Vorota, and over there, quite close by, in one of the new houses on Malaya Bronnaya, engineer Petr Mikhailovich Borisov, a laureate of the Stalin Prize lives and works on his project of a miraculous dam.

A tall, broad-shouldered man with small brown eyes opened the door. His hair and moustaches peppered with white spoke of the numerous roads and paths he had walked in his lifetime.

Books, that was what caught my eye when my host invited me into his study. Books were everywhere: in bookcases, on bookcases, on bookshelves reaching up to the very ceiling, books on the desk, on the window sill. Maps, too... Maps, maps, and maps... A great many maps, physical maps, economic and climatic maps.

We began talking about his project.

"Well, maybe all that is a flight of imagination, a dream, but a dream, you know, is not utterly unrealizable," said Borisov. "It is true," he added, taking down a fat folder, "that for the time being the dam is so light you can carry it under your arm."

Leafing through a thick volume on the physics of the sea which was lying on the desk, I found in it a complete form of the Committee on Inventions and Discoveries provided with all official seals and signatures. It was Patent No. 7337, which stated that it had been issued to P. M. Borisov for a project of his bearing an unusual title: "A Radical Climate Improvement in the Arctic and Temperate Zones of Our Earth."

It is the author's idea that a dam across the Bering Strait will contribute to climate improvement.

The Birth of a Dream

Where was the dream to improve the earth's climate born?

"It is even difficult to remember it now." Petr Mikhailovich shrugged his shoulders. "A long time ago, I believe, maybe as far back as the end of the twenties when I graduated from the Moscow Academy of Mining and went to North Sakhalin to work on oil fields. It was hard to drill through the frozen soil, and to build on it. Severe frosts bothered us. Willy-nilly, our thoughts turned to warmth."

For dozens of years, the thought of warmth persisted in his mind. Cold winter weather complicated the construction of the plants of "Neftegaz" in Moscow and Gorkiy. It interfered with the first Soviet cracking installations. Engineer Borisov felt the influence of cold weather on the progress of the construction of the Saratov-Moscow gas pipeline (it was here, by the way, that Petr Mikhailovich received the Stalin Prize). He felt it in far-away Mongolia where oil fields were being created and an oil refinery was being built, as well as at many other construction sites.

More and more did Borisov think about artificially changing the climate. Already construction engineer in the oil and gas industry, he would become a climatologist, oceanographer and paleontologist in his free time.

The explorer's catalogue lists five thousand articles and books. Those books made him familiar with seas and oceans, with their cold and warm currents; they revealed to him many secrets of nature. The Arctic Ocean and its basin -- these are the sources of the cold climate in many parts of the globe. The idea of an artificial thawing of the Arctic was becoming clearer and more feasible.

In Front of the Map of the World

"Before telling you about the dam itself," began Petr Mikhailovich, "I would like to give you a piece of geographical information. Look here..." And he placed upon the desk a huge map in the center of which, covering thirteen million square kilometers, lay the Arctic Ocean.

In the south, southwest, and southeast, the Soviet Union is fringed by a fanciful ornament of tall mountains. It means that our country is barred to the access of warm air currents on three sides. As to the forth side, in the North, the Soviet Union is exposed to the cold air masses of the Arctic Basin. That's why regions of permanent frost constitute almost half, 47 percent of all our country: three fourths of the territory are tied up by a -40 degree (Centigrade) frost in January; fifteen percent of it is wild, silent tundra. In summer, the cold dry air that descends into our latitudes from the ice-bound expanses of the ocean gets warmed up in the plains, and, like a gigantic leech, sucks moisture out of the soil and plants. Hence come the frequent droughts and dry winds in the Volga region, the Caspian lowlands, and in a number of other areas.

One point more: cold is a beast of prey that devours tremendous sums of money. The construction of plants, electric power stations, coal mines in the northeastern part of our country, as well as in other countries with the same kind of climatic conditions, costs one-and-a-half to two times as much as it would cost in regions with a temperate climate. On an average, in the Soviet Union, cold weather claims at least ten percent of all capital investments, without bringing any return. Let's remember one figure: 1,940 billion rubles. Everybody knows that figure, the amount of capital investments during the Seven-Year Plan. Of that sum, about twenty billion rubles will be spent as a tribute to cold weather. And what losses are caused by the

conservation of our sea and river transport during winter periods? And the Northern Sea Route itself? It is the most expensive and labor-consuming route of all the sea routes of the world!

That is, as far as we are concerned. And how is it abroad? It is the Arctic Ocean that is mainly to blame for the fact that rice does not always ripen fully in northern Japan, that the northern part of the Yellow Sea freezes; it often complicates the work of vinegrowers in France, and causes a lot of disappointment in Italy and Germany. And take Canada. Vast expanses there are nothing but tundra and regions of permanent frost.

But it is the life of Americans that the Arctic Ocean complicates most, just as it does in our country. Alaska is a land of severe frost. Seventy percent of that fourth-ninth State, the largest of them all, is a land of permanent frost. The severe climate of the Arctic Ocean is felt even in the very heart of the United States. Not far from New York lies the Gulf of St. Lawrence, located right on the route from the largest industrial district of the United States, the district of the Great Lakes, into the Atlantic Ocean. The Lakes are open for navigation for a long period every year, while the Gulf of St. Lawrence which is the exit to the Atlantic is ice-bound for a good half of the year, and Americans must spend huge sums of money to fight their way through it.

"We must thaw the ice in the Arctic Ocean," concluded the engineer, in such a businesslike and imperturbable tone, that might have been talking about some common everyday thing.

Central Heating System of the Globe

Our famous climatologist Aleksander Ivanovich Voyeikov, speaking figuratively, once called warm currents the steam pipes of the central heating system of our earth. So engineer P. M. Borisov got the idea of installing such a powerful "heating system" in the Arctic Ocean, one which would be able to thaw its ice.

"First let's see why the ice was formed there," said Petr Mikhailovich. "Not because the ocean water is too cold. Not at all. It's not the ocean that's to blame for it, it's the rivers that discharge into it, -- the Ob, the Lena, the Yenisey, and others. Their fresh water has a lower density than that of the salt water of the ocean. Flowing into the ocean, their water forms a semi-salty layer that freezes, creating an icy crust. That crust blocks the

passage for the warm deep water that should warm up the cold Arctic air."

Consequently it is necessary to do away with the ice. How can this be done? It could be accomplished by the powerful warm current of the Gulf Stream, which enters the Arctic Ocean by way of the Atlantic Ocean. If it got into the Arctic Ocean unhindered, it would soon melt its ice. But the Ocean defends itself. And its Atlantic boundaries, the Ocean sends forth its cold currents, mainly, the Labrador and the East Greenland currents toward the Gulf Stream. The two of them cool off and weaken the Gulf Stream to such an extent that it plunges under the ice core, hardly disturbing it.

Borisov decided that it was necessary to neutralize the cold currents by opening a "green street" for the Gulf Stream. But how was it to be done?

Across the Bering Strait! If a dam could be erected there and supplied with pumps that would pump the water out of the Arctic Ocean into the Pacific Ocean, the cold streams would be paralyzed: they "would not be allowed" to come into contact, to mix with the Gulf Stream.

At the same time, these pumps will force the inflow of the warm current of the Gulf Stream. They will draw, suck it in. The Gulf Stream, liberated and preserving all its warmth, will make its way through the Arctic Ocean, and will give up its warmth to it. Instead of bizarre counter-currents of the warm and cold streams that always sustained and renewed the ice crust, a direct flow of the warm water of the Atlantic into the Pacific Ocean via the Arctic Ocean will be created. This direct flow will destroy the ice.

But not only will that make the climate warmer. The thing is that ice and snow reflect into the space up to 90 percent of the heat of the sun. Water, on the contrary, greedily absorbs it. If we imagine for a moment that the ice in the Arctic Ocean has melted away, then the volume of the heat absorbed by that water will exceed the volume of heat contained in the coal, oil, and gas mined in the whole world at present by about one hundred and fifty times. Our planet will become rich in heat and moisture in a truly fairy-tale manner.

The Dream Can be Realized

"And now," says my host, "we can pass over to the Bering Strait dam itself, which can solve all that problem." Petr Ivanovich opens his sacred folder. Hundreds of typed

pages, with numerous tables, drawings, sketches, plans and calculations...

I look at the map again... The Bering Strait... A narrow light blue strip which connects our Chukotka with American Alaska.. This is where P. M. Borisov is planning to erect a dam.

But how is such a gigantic construction to be erected? It is not at all so simple to confine in reinforced concrete seventy-four kilometers of the Strait, about fifty meters deep on an average.

"The dam, of course, is planned to be prefabricated," explained Petr Mikhailovich, "something like that." And he showed me a sheet of drafting paper which presented a multi-tiered staircase of reinforced concrete blocks, pontoons with built-in pumps, i. e. with water-driving screw propellers. "These pontoons can be made, let's say, in Vladivostok, and on the American coast, then floated to the Bering Strait. I am speaking about the American coast because Canada and the United States are also interested in making the Arctic warmer."

That will probably cost hundreds of billions rubles? I tried to figure out how much such a structure unlike any ever heard of in the history of mankind, could cost.

"Well, what are you saying!" said Petr Mikhailovich in surprise. "Why hundreds! In my estimate, the dam will cost about seventy billion rubles. It's a lot of money, of course. But if we think that 31 billion rubles was spent on cultivating the virgin lands, and the investment has already been paid back with interest, then is the sum of 70 billion such an immense one if it will make warmer hundreds of millions of hectares of land? Upon my word, the devil is not so black as he is painted."

The plan and estimate seem to have foreseen everything. They indicate in detail the cost of pontoon construction, their transportation and installation. The cost of all floating and stationary powerplants, construction machines, research, air-and-sea ports has been listed. A city will rise there, too, with all the amenities for normal and cultural life for the people who will build the dam, and then direct the waters of the ocean. Thus, what had at first glance seemed a flight of fancy, now, being backed by facts and figures, took some definite and tangible shapes and forms.

Some scientists consider that dream a utopia for the time being. But a flight to the moon was quite recently regarded as an idle dream of people with a fiery imagination. Other scientists, and a number of research institutes, after having familiarized themselves with the project of the Bering

Strait dam, believe that its construction is a feasible thing. For all construction, electric power is necessary, of course. Where will it be found on a wild piece of land like that?

"Yes, that is a complicated problem," Petr Mikhailovich agreed with me. "But it is not unsurmountable. The amount of power required will be considerable, something like the volume produced by four Stalingrad or two Bratsk hydroelectric power stations. How shall we get this power? First of all, in our atomic age we can dream of a dozen or so floating atomic power plants. And that is not the only possibility. The huge areas around the Arctic Ocean are rich in coal, oil, gas. These depositories are little known at present. But gas has already been discovered in the Vilyuisk Basin on the banks of the Lena. There is no doubt that gas fields in the district of the Upper Yen Bent is a matter of the not-too-distant future. Thus, a gas pipe line from 3000 to 3500 kilometers long will successfully solve the problem of electric power. Further on, Americans are prospecting for oil in Alaska close to the Strait, and I am sure they will find it. Let us consider an emergency: suppose there is neither atomic energy, nor coal, nor gas, nor oil available near the site, either on our or on the American side. People know how to transmit electric power along wires a thousand kilometers long. It is so difficult to imagine those open-work electric towers coming down to the Bering Strait from Siberia or Canada?

When Will the Warming Up Occur...

That is how the Bering Strait dam came into existence: for the time being, still a dream on paper...

What will happen when the project will leave the sheet of drafting paper and become embodied in concrete and steel?

Petr Mikhailovich is dreaming of wonderful things: of cherry and apple orchards in Yakutiya, for, in that case, its climate will become like that of Orel and Bryansk. He is dreaming of the time when ships will sail unhindered all the year round along the coast of the Arctic Ocean up to Wrangel Island, for the temperature there will be the same as in the Ukraine. He is also dreaming of the time when regions of permanent frost will disappear in our country, in Alaska, in Canada, and the unpopulated tundra will be covered with flowering grazing and meadow lands. French vine-growers and Japanese rice growers will sleep undisturbed. The Gulf of St. Lawrence will open its gate to the Atlantic Ocean for the American merchant fleet. The Arctic will

become warmer, too. Life for people all over the world will become better, happier.

Petr Mikhailovich got up, took a turn about the room, and stopping at the window, was lost in thought.

"You see," he began after a pause, "the dam has been designed with consideration for all the real technical possibilities of our time. But one should not try to simplify the matter, it would be a mistake. The problem is not the amount of billions -- the project will pay pretty soon: it's the working conditions. Think of those conditions! The Bering Strait is not the Volga, not the Yenisey. It's unpeopled. The scale of the work is unusual. Such a grandiose problem can be solved only with difficulty, and maybe even cannot be solved at all by one State alone, no matter how big it may be. What are needed are joint efforts, joint searches, and the combined creative undertaking of many states. Almost the entire Northern hemisphere, especially Canada, the northeastern part of the United States, the Scandinavian countries, Germany, Poland, China, and northern Japan, will profit tremendously by the warming up of the Arctic. All of them, of course, can and must make their contributions to the project. But the main interest, in essence and all justice, will remain that of the two most powerful states in the world, the Soviet Union and the United States, who are next-door neighbors in the region of the Bering Strait."

"And here," concluded Petr Mikhailovich, "is what I would like to dream about this: the heads of the two states met in Washington; somewhat later, they will meet in Moscow in order to continue their discussion, begun in Washington, of many problems interesting to all mankind. The main problem which is on the minds of both, N. S. Khrushchev and D. Eisenhower, is that of warming up the political climate. When this warming up occurs, and the ice of the cold war melts, broad vistas for teamwork in warming up the eternal ice of the Arctic Ocean will open, too. How close together the common struggle for such a great humanitarian cause as discovering for mankind new powerful sources of warmth and life will bring our peoples."

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